

CLAIMS

1. A system architecture for managing a telecommunication network (N) including network equipments, said equipments having associated control interfaces (if_N_α, if_N_w, if_N_y, if_N_t), the architecture comprising:
- a base layer (RA, RP) proxying said interfaces (if_N_α, if_N_w, if_N_y, if_N_t) and decoupling said interfaces (if_N_α, if_N_w, if_N_y, if_N_t) from management functions, and
 - a support layer (AA) comprised of a community of agents co-ordinating operation of said base layer (RA, RP) in order to support distributed management functionalities, said base layer and said support layer constituting separated superposed layers in said architecture.
2. The architecture of claim 1, characterized in that said distributed functionalities include FCAPS (Fault, Configuration, Accounting, Performance, Security) functionalities.
3. The architecture of claim 1, characterized in that said base layer includes:
- a sub-layer of protocol adapters (PA) for interfacing a set of network equipments offering a given protocol, and
 - a sub-layer of resource proxy modules (RP), each said proxy module (RP) providing a representation of the configuration of a given network equipment according to a defined information model.
4. The architecture of claim 3, characterized in that said resource proxy modules (RP) are configured for aligning said representation to the network of a given network equipment by at least one operation selected out of the group consisting of:

- performing all the management actions on said network (N) by invoking operation through at least one associated protocol adapter (PA);
 - receiving at said resource proxy modules (RP)
5 all the notifications sent by said network equipments;
and
 - performing a periodical verification of alignment between the representation of the network equipments and said network equipments.
- 10 5. The architecture of claim 4, characterized in that said resource proxy modules (RP) are configured for enrichment with element manager information.
6. The architecture of claim 4, characterized in that said resource proxy modules (RP) are configured
15 for running processes using a process executor (PE).
7. The architecture of claim 4, characterized in that said resource proxy modules (RP) are configured for interacting directly with one another in an inter-working relationship.
- 20 8. The architecture of claim 1, characterized in that said agents (AA) in said community are configured for running vendor and technology independent services.
9. The architecture of claim 1, characterized in that it includes at least one manager application (MA)
25 configured for performing functions selected from the group consisting of:
- managing distribution of processes between said base layer and said support layer,
 - managing distribution of information models
30 between said base layer and said support layer,
 - monitoring the state of the architecture on the basis of information provided by said agents (AA) in said community,
 - interacting with external systems, and
 - 35 - executing management processes.

10. The architecture of claim 9, characterized in that said at least one manager application (MA) comprises a separated, additional upper layer in said architecture.

5 11. The architecture of claim 9, characterized in that said at least one manager application (MA) is at least partly integrated to said support layer (AA).

12. The architecture of claim 1, characterized in that all said layers in said architecture include
10 process executors (PE).

13. The architecture of claim 12, characterized in that said process executors (PE) comprise at least one of a workflow, a rule engine and combinations thereof.

14. The architecture of claim 1, characterized in
15 that said architecture includes agents (AA) hosted on different machines, said agents being movable among different machines.

15. The architecture of claim 1, characterized in that said layers (PA, RP; AA; MA) in said architecture
20 include components adapted to perform respective functions based on respective instruction information provided to them and in that a data base (MDB) is provided storing said instruction information, the architecture being arranged for distributing said
25 instruction information from said data base (MDB) to said components.

16. The architecture of claim 15, characterized in that said instruction information comprises at least one of:

- 30 - process definitions such as workflows and rules,
and
- data model definitions.

17. The architecture of claim 15, characterized in that it includes at least one manager application (MA)
35 configured for managing distribution of information

models between said base layer and said support layer, and in that said data base (MDB) is associated with said at least one manager application.

18. A method of managing a telecommunication network (N) including network equipments, said equipments having associated control interfaces (if_N_α, if_N_w, if_N_y, if_N_t), the method comprising the steps of:

- providing a base layer (RA, RP) proxying said interfaces (if_N_α, if_N_w, if_N_y, if_N_t) and decoupling said interfaces (if_N_α, if_N_w, if_N_y, if_N_t) from management functions, and
- supporting distributed management functionalities via a support layer (AA) comprised of a community of agents co-ordinating operation of said base layer (RA, RP), said base layer and said support layer constituting separated superposed layers in said architecture.

19. The method of claim 18, characterized in that it includes the steps of including FCAPS (Fault, Configuration, Accounting, Performance, Security) functionalities as said distributed management functionalities.

20. The method of claim 18, characterized in that it includes the steps of providing:

- a sub-layer of protocol adapters (PA) for interfacing a set of network equipments offering a given protocol, and
- a sub-layer of resource proxy modules (RP), each said proxy module (RP) providing a representation of the configuration of a given network equipment according to a defined information model.

21. The method of claim 20, characterized in that it includes the step of configuring said resource proxy modules (RP) for aligning said representation to the

network of a given network equipment by at least one operation selected out of the group consisting of:

- performing all the management actions on said network (N) by invoking operation through at least one
5 associated protocol adapter (PA);

- receiving at said resource proxy modules (RP) all the notifications sent by said network equipments; and

- performing a periodical verification of
10 alignment between the representation of the network equipments and said network equipments.

22. The method of claim 21, characterized in that it includes the step of configuring said resource proxy modules (RP) for enrichment with element manager
15 information.

23. The method of claim 20, characterized in that it includes the step of configuring said resource proxy modules (RP) for running processes using a process executor (PE).

20 24. The method of claim 20, characterized in that it includes the step of configuring said resource proxy modules (RP) for interacting directly with one another in an inter-working relationship.

25 25. The method of claim 18, characterized in that it includes the step of configuring said agents (AA) in said community for running vendor and the technology independent services.

26. The method of claim 18, characterized in that it includes the steps of providing at least one
30 manager application (MA) for performing steps selected from the group consisting of:

- managing distribution of processes between said base layer and said support layer,

- managing distribution of information models
35 between said base layer and said support layer,

- monitoring the state of said layers on the basis of information provided by said agents (AA) in said community,

- interacting with external systems, and
- 5 - executing management processes.

27. The method of claim 26, characterized in that it includes the step of configuring said at least one manager application (MA) as a separated upper layer in addition to said base proxying layer and said support
10 layer.

28. The method of claim 26, characterized in that it includes the step of at least partly integrating to said support layer (AA) said at least one manager application (MA).

15 29. The method of claim 18, characterized in that it includes the step of providing process executors (PE) in all said layers.

30. The method of claim 29, characterized in that it includes the step of providing in said process
20 executors (PE) at least one of a workflow, a rule engine and combinations thereof.

31. The method of claim 18, characterized in that it includes the steps of:

- hosting at least part of said agents (AA) on
25 different machines, and
- moving said agents among different machines.

32. The method of claim 18, characterized in that it includes the steps of:

- including in said layers (PA, RP; AA; MA)
30 components adapted to perform respective functions based on respective instruction information provided to them;

- providing a data base (MDB) is provided storing said instruction information, and

- distributing said instruction information from said data base (MDB) to said components.

33. The method of claim 32, characterized in that it includes the step of providing in said instruction
5 information at least one of:

- process definitions such as workflows and rules, and
- data model definitions.

34. The method of claim 32, characterized in that
10 it includes the steps of:

- providing at least one manager application (MA) configured for managing distribution of information models between said base layer and said support layer, and
- 15 - associating said data base (MDB) with said at least one manager application.

35. Communication network associated to control interfaces (if_N_a, if_N_w, if_N_y, if_N_t) and to a management system architecture according to any of
20 claims 1-17.

36. A computer program product loadable in the memory of at least one computer and including software code portions for performing the steps of the method of any of claims 18 to 34.